Interference Between Mobile Radio Systems and Wireless Microphones

Mobile Device

F_1

F_2

Base Station

Wireless Microphone

F_3

Microphone Receiver

If a wireless microphone operates on the same channel used by a mobile radio system, i.e., $F_3 = F_1$ or F_2, there is a significant risk of harmful interference.

Interference With Mobile System Uplink

F_1

I_1

Mobile Device

Base Station

I_2

F_1

Wireless Microphone

Microphone Receiver

There is potential for wireless microphones to interfere with mobile base stations (I_1).

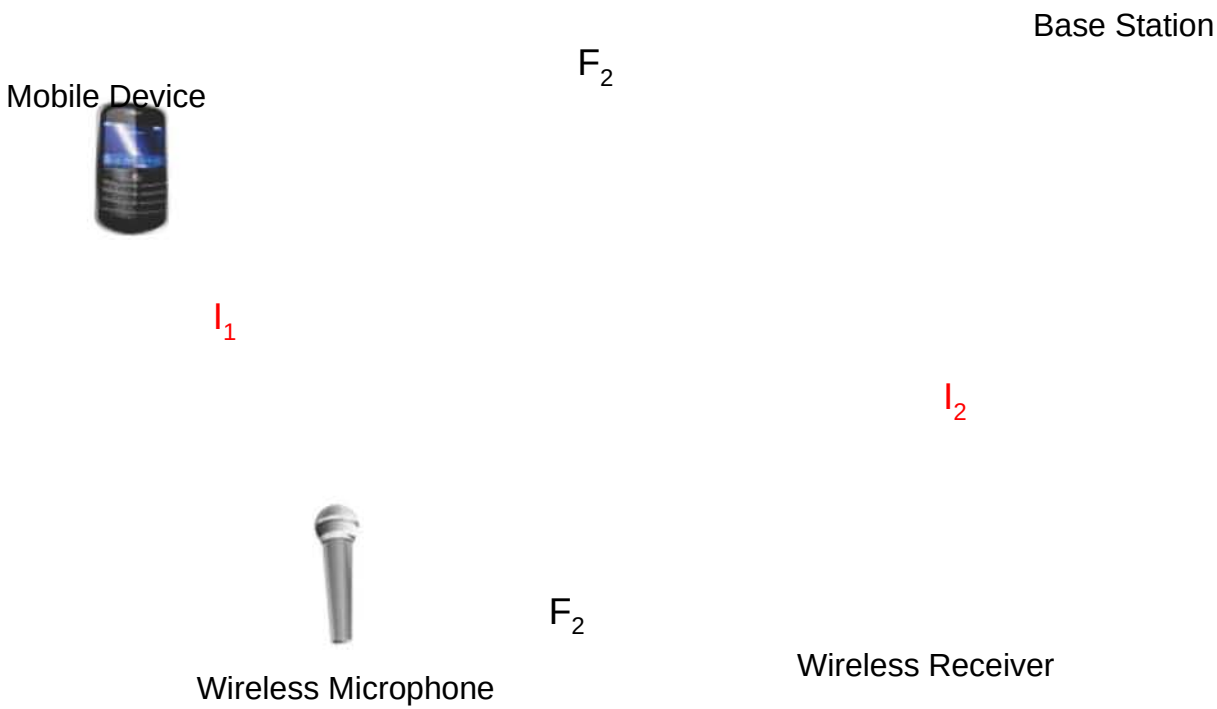
- Interference at the base station affects all mobile system users
- Interference is greatest when close to the base station
- Impact area anywhere from 0.8 km to 3.3 km (for Tx = 10 mW to 250 mW)

There is potential for mobile devices to interfere with the microphone receiver (I_2).

- Interference is greatest when close to receiver, e.g., inside same building

Microphones can cause interference without experiencing interference, e.g., when they are operated close to a base station but no mobile devices are operating near the microphone receiver. Even when mobiles are nearby, the risk of interference to microphones is low because mobiles are operated at much lower power (because they are near the base station).

Interference With Mobile System Downlink



There is potential for wireless microphones to interfere with mobile devices (I_1).

- Interference is greatest when close to mobile device, e.g., inside same building
- Impact area anywhere from 100 to 400 meters (for Tx = 10 mW to 250 mW)

There is potential for mobile base stations to interfere with microphone receivers (I_2).

- Interference is greatest when base station is located nearby

Microphones can cause interference without experiencing interference, e.g., when they're operated far from a base station but where mobiles are operated nearby. In this scenario, mobiles are already trying to receive a weak signal and could be overloaded by a strong signal from the microphone.